

# AMERICAN SOCIETY FOR TESTING MATERIALS

## BULLETIN

260 SOUTH BROAD STREET

PHILADELPHIA, PA.

"Promotion of Knowledge of Materials of Engineering and Standardization of Specifications and Methods of Testing"

Number 78

January 31, 1936

### Regional Meeting in Pittsburgh

#### Symposium on High-Strength Constructional Metals; Committee Meetings Throughout Week

ON MARCH 4 at the Hotel William Penn in Pittsburgh the 1936 A.S.T.M. Regional Meeting will be held and during the week beginning Monday, March 2 and extending through Friday, March 6, the 1936 Spring Group Meetings of A.S.T.M. Committees will be in progress.

As previously mentioned, the Pittsburgh District Committee, headed by Dean Harvey, with F. M. Howell, secretary, is in charge of the arrangements. A special program committee is developing the Symposium on High-Strength Constructional Metals which is to be the technical feature of the meeting. This committee is headed by Jerome Strauss and includes a number of other Society members.

The district committee has held a number of meetings and is "leaving no stone unturned," so that not only the symposium, but the entertainment features of the meeting will be of widespread interest. W. H. McCune is chairman of the committee in charge of the dinner and related features, and Max Hecht is making arrangements for interesting industrial plant visits.

#### SYMPOSIUM

The Symposium on High-Strength Constructional Metals will comprise five technical papers, three in the non-ferrous field and two covering ferrous metals. The papers and authors are as follows:

##### MORNING SESSION

Alloys of Aluminum and Magnesium—E. H. Dix, Jr., Chief Metallurgist, and J. J. Bowman, Metallurgical Division, Aluminum Research Laboratories, Aluminum Company of America.  
Alloys of Copper—C. H. Davis, Metallurgist, The American Brass Co.  
Alloys of Nickel—F. M. Geiger, Research and Development Dept., The International Nickel Co.

##### AFTERNOON SESSION

Carbon and Low-Alloy Steels—E. F. Cone, Editor, *Metals and Alloys*.  
Corrosion-Resisting Steels—E. E. Thum, Editor, *Metal Progress*.

The session on non-ferrous metals will begin Wednesday morning at 9:30. Messrs. N. L. Mochel and R. F. Mehl will act as joint presiding officers. The papers on ferrous metals will be given in the afternoon session beginning at 2 p. m.,

with Dr. H. W. Gillett and Prof. H. F. Moore presiding.

In accordance with the plans of the program committee the several authors, who are thoroughly familiar with their respective subjects, plan to consider metals and alloys that are employed in constructional applications, such as buildings, bridges, car bodies and the like. Each paper will deal with mechanical and physical properties and will give manufacturing and fabricating data. The questions of design stresses, constructional economy, etc., will not be featured.

A few advance copies of the papers to be presented in the Symposium on High-Strength Constructional Metals are being made available in order to solicit discussion. Members wishing to present such discussion can obtain a copy of the particular paper in which they are interested by writing to A.S.T.M. Headquarters.

The committee is allowing ample time for discussion of the papers and a number of technologists have been invited to present their views on various phases of the subjects covered in the papers.

#### DINNER AND INSPECTION TRIPS

The Regional Meeting Dinner will be served at 6:30 p. m. and the committee has set a price of \$2 per person, covering all charges.

Following the dinner it is planned to have a brief statement of the activities of the Pittsburgh District Committee by Mr. Harvey, an address by H. S. Vassar, President of the A.S.T.M., an address by Dr. S. M. Kintner, Vice-President in charge of Engineering of the Westinghouse Electric & Mfg. Company, and a talk by B. H. Witherspoon, President of the Pittsburgh Testing Laboratory, in which Mr. Witherspoon will, among other things, call attention to the Open House to be held by the Pittsburgh Testing Laboratory probably on Thursday evening. In connection with Doctor



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Kintner's address it is planned to show a sound film entitled "The New Frontiers."

The committee in charge of inspection trips is completing arrangements for visits to the Aluminum Research Laboratories, the Gulf Oil Co. Research Laboratories, and the Mellon Institute of Industrial Research. Each of these trips will be scheduled for one day only, the particular day for each visit to be assigned after the schedule of committee meetings is arranged. Each member of the committees meeting will receive detailed information well in advance and of course complete information will be available at the Society registration desk. The inspection trips will emphasize research work being carried on in the Pittsburgh district.

#### GROUP MEETINGS OF COMMITTEES

Many of the Society committees are planning to take advantage of the opportunity offered by Committee Week to hold meetings in Pittsburgh. This procedure of concentrating meetings during the five-day period has been successful from the start and of course is helpful in conserving time and expense of a large number of members who follow the work of different committees. Careful study is made to develop a schedule having a minimum of conflicts. A list of the committees which thus far have decided to meet in Pittsburgh follows:

- |   |   |
|---|---|
| A-1 on Steel  | D-4 on Road and Paving Materials  |
| A-2 on Wrought Iron                                 | D-5 on Coal and Coke  |
| A-5 on Corrosion of Iron and Steel                  | D-8 on Bituminous Waterproofing and Roofing Materials                                 |
| A-6 on Magnetic Properties                          | D-11 on Rubber Products   |
| A-7 on Malleable Iron Castings                      | D-19 on Water for Industrial Uses   |
| A-10 on Iron - Chromium - Nickel and Related Alloys | E-4 on Metallography  |
| Coordinating Committee on Non-Ferrous Metals        | Research Committee on Phosphorus and Sulfur in Steel                                  |
| B-1 on Copper Wire                                  | E-9 on Research   |
| B-5 on Copper and Copper Alloys                     | Joint Committee on Exposure Tests of Plating on the Non-Ferrous Metals                |
| C-1 on Cement                                       | Research Committee on Fatigue of Metals   |
| C-3 on Brick  | E-1 Subcommittees   |
| C-7 on Lime   | Subcommittees of Joint Committee on Effect of Temperature on the Properties of Metals |
| C-9 on Concrete and Concrete Aggregates             |   |
| D-1 on Preservative Coatings                        |   |
| D-2 on Petroleum Products and Lubricants            |   |

Pittsburgh Skyline



Returns have not been received from a number of committees which it is known are considering meeting and it is anticipated many of these will participate. Further details will be furnished each member of the committees participating.

#### RAILROAD TRANSPORTATION

Many of the railroad passenger associations have already granted reduced fares for the Pittsburgh meetings and it is expected these reductions will be in effect for all sections of the country as in previous years. Reductions will be on the certificate plan and provide for fare and one-third for the round trip provided the same route is used going and returning.

Members should purchase the regular one-way ticket to Pittsburgh and be sure to get from the ticket agent a *certificate (not a receipt)* when purchasing their tickets. These certificates will be validated by the railroad representative at the A.S.T.M. desk and with this validated certificate members can purchase a return ticket at one-third fare. It is urged that members deposit their certificates at the A.S.T.M. desk as soon as they register.

Tickets may be purchased several days in advance of March 2, depending on the location, and the plan provides that the return ticket can be obtained a number of days after close of the meetings. *Members should check these details with their local agent well in advance and be sure to get their certificate when purchasing their going ticket.*

#### 1936 Nominating Committee

BASED ON the report of the tellers, J. E. Brewer, Consulting Chemist, Brewer & Gardner and E. M. Kenworthy, Warner Co., both of Philadelphia, on the recommendations of members for appointments on the 1936 Nominating Committee for officers, the Executive Committee has appointed the following members of the Society to serve:

Members	Alternates
Harold Farmer	K. G. Mackenzie
W. H. Klein	F. R. McMillan
Henry Wysor	V. H. Lawrence
Stanton Walker	A. T. Goldbeck
F. M. Waring	J. B. Young
Arthur W. Carpenter	H. A. Depew

Since these members have just been notified of their appointment, there has not been sufficient time to receive acceptances but in case of declination or the inability of a member to be present at the meeting the respective alternate will serve. The Nominating Committee, which in accordance with the By-laws, also includes Past-Presidents Cloyd M. Chapman, T. R. Lawson and Hermann von Schrenk as *ex-officio* members will meet early in March to select nominees for President, Vice-President and 5 members of the Executive Committee whose terms expire with the June, 1936, meeting. The nominees will be announced in a forthcoming BULLETIN and each Society member will of course receive his election ballot in advance of the annual meeting in June.

# Review of Society Activities in 1935

## Standardization and Research Work Described; Current Committee Programs Discussed

**D**URING THE PAST year noteworthy progress was made in advancing the work of the Society along many lines. Standing committees pushed their programs, in many cases very extensive ones, forward and as a result important progress was made in A.S.T.M. standardization and research activities. Following the general résumé of Society activities as a whole which appears below there are given reviews of developments as reported by the various committees. The sections are arranged so that a member interested can refer directly to this part of the review.

### ANNUAL MEETING

The annual meeting, held in Detroit, was a very successful one viewed from the standpoint of committee accomplishments presented, number and quality of technical papers given and attendance. Thirty-nine of the Society's committees submitted annual reports and besides the Symposium on Spectrographic Analysis, which included six technical papers, there were 37 other papers presented. The total registered attendance, 1012, was exceeded by only two other meetings, in 1930 and 1931.

One phase of the Society's work on which a number of committees are working that came in for special attention was corrosion. The reports of Committees A-5 on Corrosion of Iron and Steel, B-3 on Corrosion of Non-Ferrous Metals and Alloys, B-6 on Die-Cast Metals and Alloys and D-14 on Screen Wire Cloth were of unusual interest because of the valuable data presented. Only those directly concerned with this important research work fully realize the immense amount of time and effort expended in advancing it.

An important achievement at the meeting was the Symposium on Spectrographic Analysis sponsored by the Society's Committee E-2 on this subject. The committee felt, in view of the growing importance of the spectrograph in analytical work of materials, that the presentation of several papers outlining procedures that have been found applicable in the analysis of various materials, particularly metals, would be pertinent.

The Detroit Committee on Arrangements assisted in the development of the program and arranged to have a discussion on the subject "The Relationship of Materials to the House of Today and Tomorrow" and two interesting papers were presented, one dealing with "The Federal Housing Problem" and the other, "Role of Materials in Modern Housing."

A Symposium on the Place of Materials in Automobile Roads and Rides stimulated discussion of problems relating to road and automotive materials and gave an opportunity for a number of the Society standing committees to outline work they are doing in this field.

### REGIONAL AND LOCAL MEETINGS

The 1935 Regional Meeting, held in Philadelphia, was featured by a Symposium on Paint and Paint Materials sponsored by A.S.T.M. Committee D-1 on Preservative Coatings for Structural Materials. There was a splendid attendance

of about 400 in each of the two sessions at which the 15 papers comprising the symposium were presented. The committee was desirous that the information and data presented would be of particular interest from the viewpoint of the consumer as well as those concerned with production, and a study of the printed symposium will indicate that this desire was achieved. There were some 135 meetings during A.S.T.M. Committee Week and the total attendance, 615, exceeded that of any group meetings yet held.

Of major importance in the Society's work during the past year was the reorganization of a number of the A.S.T.M. district committees in leading industrial centers, these changes being in accord with the new District Committee Charter which provides the committees with a more permanent basis and greater autonomy. One of the purposes of district committees is to bring the work of the Society more closely to members in their district and local meetings do much to achieve this objective. During the year, successful local meetings were held in New York and Cleveland under the sponsorship of the district committees in these two cities.

### STANDARDIZATION

Some indication of 1935 activity in the field of standardizing specification requirements and methods of testing materials can be gained by comparing the number of A.S.T.M. standards and tentative standards at the close of 1935, namely, 794, with the total at the end of 1934, 732—an increase of 62. Of the specifications and tests now sponsored by the Society, 504 have been adopted as official standards, while 290 have been issued as tentative standards. Much of the committees' standardization work during 1935 was concerned with development of requirements for a large number of materials and subjects not previously covered in the standardization work.

### PUBLICATIONS

During the year important progress was made in publishing a number of special books, particularly compilations of standards relating to specific industrial fields. For a number of years, certain committees have sponsored the issuance in bound form of all the specifications under their jurisdiction and to this growing list in 1935 was added the compilation of A.S.T.M. Standards on Rubber Products. This brings the total of such special compilations to seven and the already widespread and increasing distribution of these books is accomplishing much in promoting knowledge of A.S.T.M. work and especially a use of the standards it has issued.

### REVIEW OF COMMITTEE WORK

On the pages which follow there are presented summaries of outstanding accomplishments of A.S.T.M. committees, this material being based on special summaries submitted by the committee officers. It will be noted that the reviews are segregated, committees in the ferrous fields appearing first, followed by non-ferrous and in turn by cementitious, ceramic, concrete and masonry materials. Then follow reviews of A.S.T.M. work on timber, preservative coatings,



petroleum products, road materials, coal and coke, electrical insulating materials, textiles, testing methods and water.

### Steel

The year 1935 has been an outstanding one for Committee A-1 on Steel. A number of specifications covering materials which were not included in existing A.S.T.M. standards for steel were prepared and published as tentative. These covered the following materials: Axle-steel concrete reinforcement bars, still tubes for refinery service, plates for boiler and other stationary pressure vessels, electric-resistance-welded boiler tubes, heat-exchanger and condenser tubes, castings for railroads and for miscellaneous industrial uses, pipe flanges for general service, pipe flanges and forged fittings for service at temperatures from 750 to 1100 F., and heat-treated steel track bolts.

Studies by the subcommittees in charge resulted in the recommendation and subsequent approval by the Society for publication as tentative of revisions in several existing standards, materials involved including steel for bridges and buildings, structural silicon steel, carbon-steel rails, carbon-steel bars for railway springs with special silicon requirements, steel and iron boiler tubes, and commercial quality hot-rolled and cold-finished bar steels. During 1936, the committee expects to push actively the development of several new specifications which are now under consideration. Several of these involve cooperative work with other organizations. One example is the joint consideration being given to the specification requirements for high-carbon and quenched-carbon steel joint bars by representatives of the Rail Committee of A.R.E.A. and Committee A-1.

The subcommittee on steel castings acting through a special section headed by Major R. A. Bull will continue its work in connection with the requirements for carbon-steel castings for miscellaneous industrial uses and carbon-steel and alloy-steel castings for railroads. Agreement has been reached in respect to requirements for massive castings where the test coupon is attached for the full length, and these requirements are now before the subcommittee for report to Committee A-1. Specifications for steel castings for marine use are being developed.

The report of the section on high-temperature data which involves the compilation and tabulation of needed information on creep properties, etc., of materials used in high-temperature service, has been completed and will be submitted for approval.

The group charged with work on die steels is contemplating tests at elevated temperatures with regard to tensile and fatigue properties. The committee is endeavoring to arrange for the preparation of tension test specimens and when these are prepared the members of the committee who have offered to carry out the high-temperature and fatigue tests will begin their work.

(Additional notes on the Steel Committee's current work appear on page 10.)

### Wrought Iron and Cast Iron

The specifications for uncoated and galvanized (zinc-coated) wrought-iron sheets proposed by Committee A-2 on Wrought Iron were published as tentative during the year.

The committee has presented revisions in its standard specifications and is continuing to review all the wrought iron specifications looking toward their further improvement and to harmonize them with other existing standards.

Committee A-3 on Cast Iron completed new tentative specifications for gray-iron castings used in the automotive and allied industries. These were developed in cooperation with the Iron and Steel Division of the Society of Automotive Engineers. A comprehensive investigation of the machined *versus* separately cast test specimen and a correlation of transverse and tension tests furnished information for an important revision of the specifications for gray-iron castings. A provision for combined carbon was added to the culvert pipe specifications and proposed definitions of terms relating to cast iron were published as information. Specifications for light gray-iron castings in which appearance and fabricating qualities are primary considerations have been completed for submission to the Society.

### Magnetic Testing

Committee A-6 on Magnetic Testing presented further changes in the test methods for magnetic properties of iron and steel to provide for testing sheet materials having preferred magnetic properties with reference to direction of rolling, and also the very high coercive force permanent magnet steels. The use of two or more permeameters for high magnetization testing of normal induction and hysteresis was also provided for by this revision which is published as tentative.

Several new permanent magnet materials have been developed during the past three or four years which have coercive forces of several hundred oersteds. Some of the permeameters previously used for testing permanent magnet materials are unsuitable for these new alloys and the accuracy of others which are available are not known with any degree of certainty. A series of these high coercive force steels is being circulated by Committee A-6 among a number of laboratories which have suitable equipment and it is hoped to determine from these tests the probable limits of accuracy of the various test methods available at maximum magnetizing forces of 2000 oersteds and higher.

There is a persistent demand for a standard core loss test for laminated materials at maximum inductions higher than 14 kilogausses. Some laboratories have difficulty in making a reliable test above this induction. A series of check samples is being tested to determine the accuracy which may be expected for maximum inductions of 15 and 16 kilogausses. After these are completed recommendations for standard tests at these higher inductions will be considered.

### Corrosion of Iron and Steel

Committee A-5 on Corrosion of Iron and Steel has reported further data and information on its outdoor exposure corrosion projects already under way or actively projected and which are pointed toward evaluation of the outdoor serviceability of bare and metallic-coated ferrous metals.

Several additional failures of the uncoated corrugated metal sheets have taken place at Annapolis, Md., after an exposure of 18 yr. While these tests are being continued, similar atmospheric tests were completed at Pittsburgh, Pa., in 1923 and at Fort Sheridan, Ill., in 1928. A number of

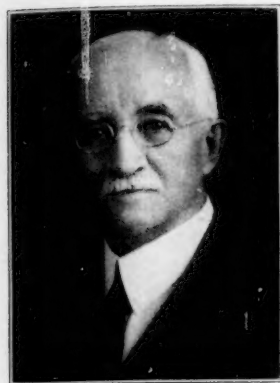
(Continued on page 12)



# A Message from Professor Talbot

## Reviews Conditions in Early Society Years; Asks for Continued Service

AT THE REQUEST of the Secretary-Treasurer, Prof. A. N. Talbot, the Society's only honorary member, has prepared a special message for the BULLETIN. This message, given below, should be of interest to every A.S.-T.M. member and to all concerned with Society activities.



A. N. Talbot

Professor Talbot was born in Illinois in 1857. His engineering training was received at the University of Illinois — B. S., 1881; C.E., 1885. In 1915 the University of Pennsylvania awarded him the degree Sc.D. and in 1916 the University of Michigan awarded him the Doctor of Engineering degree.

Since 1885 he has served on

the engineering faculty at the University of Illinois, first as Assistant Professor of Engineering and Mathematics, and for 36 years Professor of Municipal and Sanitary Engineering in charge of Theoretical and Applied Mechanics.

A member of A.S.T.M. since 1908, he was vice-president 1912-1913 and president for the term 1913-1914. He has been active in the work of many Society committees. He was a member of Committee E-6 on Papers and Publications for ten years, from its organization in 1913. He contributed many papers and valuable discussion which are incorporated in the Society's *Proceedings*, and was the first Edgar Marburg Lecturer.

An active member of many engineering and related societies, he is an honorary member of the American Water Works Assn., American Society of Civil Engineers and Western Society of Engineers. He has been a president of the A.S.C.E. and S.P.E.E. and has served for two terms as director of the A.R.E.A.

From the brief facts given above concerning Professor Talbot's achievements, it can be seen that he was an untiring worker in many fields and an active supporter of many societies. His work on behalf of A.S.T.M. has been of incalculable benefit to the Society and his record of service which is still continuing actively is a real inspiration. His message follows:

Dear Mr. Secretary:

Your request for a message for the BULLETIN brings up many pleasant memories of the early days of the Society and recollections of the pioneer attempt to develop an organization to meet the needs of the rapidly growing industrial and constructional activities of the country. Although pages could be used in writing of its formation and growth, a few words characterizing the beginnings and the purposes of the Society must suffice.

Probably few of the younger generation have a realization of the conditions attending the purchase and use of engineering materials of various kinds as late as the last years of the nineteenth century. Regardless of information possessed in some lines and of satisfactory relations between many sellers and buyers, the general conditions of that time might be called primitive when compared with present practice. Variability in the products offered by the

producer and variability in the demands of the consumer, sales talk of seller and fiat demands of the buyer, trade-mark products and "acceptable to the buyer," paucity of knowledge of properties of products and even ignorance of needed requirements, differences in viewpoint of buyer and seller, and inability to make definite specifications satisfactory to both—all these and many other differences of view were symptoms of the semi-chaotic condition in the relations between buyer and seller. Under such circumstances it was not strange that the American Section of the International Association for Testing Materials that first met in 1898 quickly changed into the American Society for Testing Materials in 1902, especially as the intervening years were times of increasing activity in industrial and constructional work. Truly the time was ripe for the formation of a co-operative organization on engineering materials.

The new Society had many obstacles to overcome. It was without precedents. It learned to do by doing. It developed methods, procedure, standards. It encouraged research and recognized its value wherever found. It fostered cooperation. It coordinated the efforts of the many. Soon it had expanded its field and trebled and quadrupled the number of its working committees. Before long it had established a reputation for fairness of procedure, correctness of information, soundness of judgment, fullness of research data, and the stability of its organization. Its specifications and standards became accepted in the engineering world. The Society began to take a high place among the organizations in the technical field and to supply a most useful purpose to the business world. Besides, its activities gave opportunities and development to a body of young and growing members, which in itself was a high service to the industrial and engineering world well worthy of recognition.

And the Society was blessed in those days with many pioneers having strength and courage and vision. Who will read the six presidential addresses of the Society's wise and far-seeing first president, Charles B. Dudley, and not be stirred by the movement of the times; their titles—"The Making of Specifications for Materials," "The Influence of Specifications on Commercial Products," "The Testing Engineer," "The Enforcement of Specifications," "Some Features of the Present Steel Rail Question," "Engineering Responsibility"?

Do not the talent and vision and aggressiveness and organizing genius of the first secretary of the Society, Edgar Marburg, stand out in the early history; he laid a foundation and a framework on which the work of the Society has made wonderful progress. And did not another pioneer among those charter signers, Robert Lesley, contribute in valuable ways to inculcating amicable relations between the two sometimes hostile groups, the producer and the consumer?

Another stalwart contributor to harmony and to the "get-together" spirit of the organization, a man who stands out in the settlement of many mooted questions, in the earlier times, is Archibald A. Stevenson; his influence was valuable and far-reaching. The names of many others come to mind who should also be included in any review of the earlier activities of the Society.

The American Society for Testing Materials has made a creditable record. In dependable research, in the building of specifications and the making of standards, in developing testing methods and in standardizing procedure, in dissemination of knowledge and in cooperational activities, the Society has reacted as one having a mission. For these maturer years the Society will be engulfed among new problems in a widened field. Since "new occasions teach new duties," the newer generation will have new opportunities and new responsibilities. Fortunately under the past leadership of the Society, many young men are growing up and developing in the *science and art of testing materials* and should be willing and able to bear the burden of a new generation. The sincere wish of the older generation is that under their guidance the Society may go on to higher standing and greater usefulness.

Sincerely yours,  
ARTHUR NEWELL TALBOT.



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## DISTRICT COMMITTEE ACTIVITIES

### Southern California Meeting

Early in March, the Southern California District Committee will hold a dinner meeting for local members of the Society and all others interested. After the dinner, two short sessions are planned. In the first, an explanation of the work and aims of the Society will be given, followed by a talk on the subject "Progress in Earthquake Design and Control" by Paul E. Jeffers. Then there will be a "get acquainted" period or recess and the second session will offer an open forum for floor discussion of selected topics relating to recent revisions of, and proposed changes in, Society standards.

An invitation will be sent to each member in Southern California, Arizona, and New Mexico, for himself and friends to attend, and each member will be asked to suggest any points or features in the Society standards or committee reports about which constructive criticism will be helpful in open group discussion.

If, for any reason, a mail notice does not reach a member in this area, he is requested to telephone or write the committee secretary, E. O. Slater, Smith-Emery Co., 920 Santee St., Los Angeles; telephone Trinity 4791. T. A. Fitch, Director, City of Los Angeles Bureau of Standards, is chairman of the District Committee.

### Detroit

In accordance with the new district committee charter, the Detroit District Committee has expanded its personnel and in a recent letter ballot elected officers. The personnel of the enlarged district committee is as follows:

#### *Term Expiring 1936*

Martin Casticum, Engineer, Textile Section, Product Development Division, U. S. Rubber Products Co.  
W. C. Du Comb, President, W. C. Du Comb Co., Inc.  
C. L. Foreman, Assistant Metallurgical Engineer, Buick Motor Co.  
J. C. Fox, Chief Chemist and Metallurgist, Doehler Die Casting Co.  
E. W. Upham, Chief Metallurgist, Chrysler Corp.

#### *Term Expiring 1937*

P. J. Baker, Engineer, Patent Dept., Motor Wheel Corp.  
T. A. Boyd, Head, Fuel Section, Research Division, General Motors Corp.  
C. E. Conde, Laboratory Director, E. I. du Pont de Nemours & Co.  
J. W. Kennedy, Huron Portland Cement Co.  
J. L. McCloud, Metallurgical Chemist, Ford Motor Co.

#### *Term Expiring 1938*

F. O. Clements, Technical Director, Research Labs., General Motors Corp.  
C. H. Fellows, Chemist, Research Dept., Detroit Edison Co.  
W. H. Graves, Chief Metallurgist, Packard Motor Car Co.  
C. E. Heussner, Materials Engineer, Chrysler Corp.  
A. E. White, Professor of Metallurgical Engineering and Director, Department of Engineering Research, University of Michigan.

As a result of the recent election, W. H. Graves was chosen chairman; T. A. Boyd, vice-chairman, and C. H. Fellows, secretary. The officers plan to hold a meeting of the committee in the near future to perfect plans of organization and prepare a program of activities. Consideration will be given to the appointment of certain subgroups in charge of membership work and meetings.

### New York

As previously announced, the New York District Committee is planning to hold a local meeting, the feature of which is to be a discussion on plastics. Mr. Carleton Ellis, an outstanding authority in this field, will be the principal speaker. While the exact date of the meeting has not been assigned, because of the wishes of the district committee officers that the meeting, if possible, be coordinated with meetings of Committee D-9, full details concerning the exact time and place will be furnished all members in the New York area.

The committee is planning to hold a meeting later in the year and at present is developing a suggested program for this that will be of definite interest to a large number of members in the metropolitan area.

### Northern California

A meeting of the Northern California A.S.T.M. District Committee, which centers around San Francisco, was held early in December. The committee reviewed its personnel and has reported the following as members:

R. E. Davis, Professor of Civil Engineering, in charge of Engineering Materials Lab., University of California.  
T. P. Dresser, Jr., Abbot A. Hanks, Inc.  
Dozier Finley, Director of Technical Research, The Paraffine Cos., Inc.  
F. E. Harris, Chief, Bureau of Specifications and Estimates, Pacific Gas & Electric Co.  
R. A. Kinzie, Consulting Engineer, Santa Cruz Portland Cement Co.  
M. C. Poulsen, Chief Engineer, Clay Products Institute of California.  
G. H. Raitt, Vice-President, The Steel Tank & Pipe Co. of California.  
J. B. Terry, Chief Chemist, Standard Oil Co.  
Dennistoun Wood, Engineer of Tests, Southern Pacific Co.

Mr. A. A. Hanks, President of Abbot A. Hanks, Inc., who has served as chairman of the committee since it was first organized in 1930, expressed a wish that he be relieved of the duties of the office and the committee elected the following to serve: F. E. Harris, Chairman; R. E. Davis, Vice-Chairman, and T. P. Dresser, Jr., Secretary.

### Chicago

On March 12 the Chicago District Committee, headed by W. A. Straw, Engineer, Western Electric Co., Inc., will sponsor jointly with the Chicago Chapter, A.S.M., a meeting at which Prof. A. V. de Forest of Massachusetts Institute of Technology will speak on "Unusual Methods of Inspection." All members of the Society in the Chicago area will receive further details concerning the exact time and place of the meeting.

The committee is also endeavoring to develop a meeting of the A.S.T.M. members to be held in February, at which time the committee hopes to have present President Vassar and the Secretary-Treasurer. Contacts are being made to obtain a speaker on a subject of prominent interest. There is also the possibility of having a round-table discussion of the work of leading A.S.T.M. committees with the object of giving members in the Chicago area who are not actively participating in certain committee work an opportunity to express their viewpoints on the status of various activities.



## DISTRICT COMMITTEE ACTIVITIES

### Fuels Symposium Features Philadelphia Meeting

THE Symposium on Industrial Fuels, which was the feature of the joint meeting held at the Engineers' Club, Philadelphia, on January 21, under the joint sponsorship of the Club and the A.S.T.M. Philadelphia District Committee, attracted a great deal of interest. At the afternoon session, there was an attendance of about 100 and some 200 were present at the evening session. Many favorable comments were heard on the papers and since they are of widespread interest, consideration is being given to the possibility of issuing them in the form of a special A.S.T.M. publication.

At each of the sessions President Bosler of the Engineers' Club gave a short address of welcome and introduced A.S.T.M. President Vassar, who pointed out briefly the desirability and benefits of cooperative activities.

At the afternoon session at which the presiding officer was Dr. R. H. Fernald, Dean of the Towne Scientific School, University of Pennsylvania, two papers were presented, one on "Liquefied Gas" by W. H. Bateman, President, Solgas, Inc., and the other "Manufactured Gas" by P. T. Dashiell, Vice-President, Philadelphia Gas Works, and Associates.

The evening session was devoted to liquid and solid fuels, with an extensive paper on "Coal and Coke" by A. C. Fieldner, Chief Engineer, Experiment Stations Division, and W. A. Selvig, Chemist, U. S. Bureau of Mines. The second paper on "Fuel Oil" was presented by H. V. Hume, Combustion Engineer, The Atlantic Refining Co. The presiding officer was Prof. J. H. Billings, Professor of Mechanical Engineering, Drexel Institute. Following the afternoon session dinner was served in the Club dining room, attended by about 125.

The desire of the committee in charge of the symposium and the cooperation of the various authors in having papers prepared in accordance with a definite outline contributed much to the interest in the papers. Each author followed the same general outline, pointing out historical background, magnitude of the industry, raw materials, tests, etc., so that the papers have considerable comparative value.

H. M. Hancock, Superintendent, Inspection Dept., The Atlantic Refining Co., Chairman of the A.S.T.M. Philadelphia District Committee, with the Secretary, Harold Farmer, Chief Chemist, The Philadelphia Electric Co., had charge of the meeting assisted by representatives from the Engineers' Club.



H. M. Hancock      Harold Farmer

### Pearlitic Malleable Iron—Cleveland

AN INTERESTING and successful local meeting was held in Cleveland on January 27 sponsored by the Cleveland District Committee. Preceding the technical session, which featured a Symposium on Pearlitic Malleable Iron, a dinner was held. The attendance at the meeting was about 125.

In opening the meeting, Dr. H. A. Schwartz, chairman of the District Committee, outlined the close cooperation between the American Foundrymen's Assn. and A.S.T.M. in the preparation of the symposium and R. E. Kennedy, Tech-



H. A. Schwartz      H. M. Boylston      A. J. Tuscany

nical Secretary, A.F.A., who was a member of the program committee, discussed the interest of long standing on the part of his association in the work of A.S.T.M. In introducing representatives of various organizations at the meeting, Doctor Schwartz expressed appreciation particularly to the American Society for Metals and Malleable Iron Founders Society for their cooperation.

President Vassar and Secretary-Treasurer Warwick, who were at the meeting, discussed various phases of the Society work. Mr. Vassar pointed out the widening recognition being given A.S.T.M. specification work and the Secretary-Treasurer stressed the importance of the Society's research program.

The symposium was prepared by a special committee as announced in the December BULLETIN. A large section of it was based on material furnished from various sources interested in pearlitic malleable iron. Professor Boylston of Case School of Applied Science, who was chairman of the program committee, presented the first section which defines the scope, gives brief historical information and discusses classes and types of the material, of which there are some 15 in common use.

The extensive data submitted by producers were outlined by D. M. Avey, Editor, *The Foundry*, and President, American Foundrymen's Assn. The third section of the symposium deals with patents in connection with the processes discussed.

In addition to Chairman Schwartz and the program committee, A. J. Tuscany, Consultant in Trade Association Organization and Management, who is secretary of the A.S.T.M. District Committee, and Messrs. J. H. Herron and C. B. Murray participated actively in completing arrangements.

It is planned to issue the symposium in printed form and further announcement will be made concerning this.



# A. S. T. M. BULLETIN

Published Bi-Monthly by

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January 31, 1936

## Encouraging

THE REPORT on Society membership at the close of 1935, as submitted to the Executive Committee at its January meeting, was encouraging. The downward trend in the membership curve that began in 1931 was halted; in fact, a slight upward turn resulted from a net gain in membership of 101 for the year. It is of interest that this net gain was the largest since 1926. The number of new members for the year was higher than for the three preceding years and it is especially significant that the losses were materially less. At the close of the year the total membership was 3594. Comparing this figure with the peak, 4417, at the end of 1930, it can be seen that there is still much ground to be regained.

An encouraging start has been made and through the efforts of the Committee on Membership, with the cooperation of all A.S.T.M. members, it is hoped much additional progress can be made during the current year. The special membership work instituted by the Headquarters Staff has met with success and is to be continued. Despite any special work that may be done, the problem is such an important one that each Society member is urged to take part, and, when an appropriate opportunity arises, to stress some of the assets of affiliation with the Society.

In connection with "Technical Society Memberships," a most interesting editorial was presented in the December issue of *Metals and Alloys* by Dr. H. W. Gillett. In his article Doctor Gillett has clearly indicated the desirability of having companies provide information for their technical men through memberships in technical societies and use of technical journals. He indicates his belief "that company provision of A.S.T.M. membership and resumption of active cooperation in its work would be excellent policy."

"There is a fundamental difference between most of the other technical societies and the A.S.T.M. The former tend primarily to act as media for the publication of papers of timely interest to their members and do very useful educational work. The A.S.T.M. performs these functions, too, but its main work is in the establishment of specifications that facilitate buying and selling, and the maintenance of quality. In the specification work it almost invariably

occurs that a need for a specification arises before there seems to exist adequate technical information upon which it can be drawn. In such a case the committee, having the matter in hand, seldom sits supinely by and waits for some one to bring in the needed information. It goes after it. If it really doesn't exist, as proven by a search among those who should have it, the committee rolls up its sleeves and digs in to get the data on a cooperative basis. Sometimes the task is too onerous to be thus handled, in which case, if the problem is really pressing, the committee is generally able to secure funds and hire the work done."

"At any rate, the spirit of the A.S.T.M. is not merely passively to deplore the absence of information, but actively to do something about it."

The Society's work is continuing to expand and some of the important tangible results of 1935 activities are indicated in the review article in this BULLETIN. Referring to the above excerpt, it can unqualifiedly be stated that the Society will continue "to do something" about many fields of work where standardization of specifications and research is important. Continuing expansion of membership will be most helpful, in fact very important, as a basis for continuing effort.

## Bulletin Change

BEGINNING with this issue the A.S.T.M. BULLETIN appears with a somewhat larger page size, improved grade of text paper and heavier cover and a new typographic style. These changes, agreed upon after careful study, are dictated from the standpoint of better readability, improved appearance and as a foundation for the gradual expansion of the BULLETIN which is in progress. Comments on the new BULLETIN style are welcomed.

The Committee on Papers and Publications has made a thorough study of the possibility of expanding the BULLETIN so that certain types of articles and reports can be brought to the members' attention sooner than otherwise possible. The committee has outlined certain material which could be included, such as papers and reports other than the more formal type of papers appropriate for the *Proceedings*, but of definite interest to a large proportion of the membership; specifications and test methods which committees may wish to have published as information; and other material, including papers given at local meetings which may not be issued in any other way. During the past year certain steps were taken in this gradual BULLETIN expansion program and further progress will be made during the coming year. The new BULLETIN style is intended as a helpful step in this direction.

## Offers of Papers

THE ATTENTION of members and others who have in mind submitting offers of technical papers for presentation at the 1936 annual meeting in Atlantic City is called to the desire of Committee E-6 on Papers and Publications to receive offers as far in advance as possible of the limiting date, February 15. All offers must be accompanied by a summary which should make clear the intended scope of the paper and point out features that in the opinion of the author justify its acceptance. Suitable blanks to be used in transmitting the necessary information will be sent promptly on application to the Society Headquarters. The Committee on Papers and Publications will meet on February 24 to consider all offers before it and give further consideration to the development of the annual meeting technical program.



## A.S.T.M. Research Fund

IN THE December BULLETIN a few facts were given concerning the A.S.T.M. Research Fund, indicating its establishment and purpose, how allotments from it are made on recommendation of the Society's Committee E-9 on Research, and that it aggregated about \$8000.

Last year the Executive Committee, cognizant of the inadequateness of the fund to meet present requirements and requests for financial aid, many of which are extremely worthy ones, and wishing to take such steps as were considered desirable to increase the fund appointed a special Research Fund Committee, consisting of Dr. F. O. Clements, chairman; Mr. K. G. Mackenzie, and Prof. H. F. Moore. This committee, after careful study of the situation, recently addressed a letter to long-time members of the Society "who have manifested their faithfulness and loyalty to A.S.T.M. in so many different ways." The committee suggested that each member consider the feasibility of setting aside in his will a sum of money for the fund, the principal of which would of course be kept intact and the interest expended in sponsoring needed research projects.

In making their appeal the committee stressed the fact that while it would welcome the larger type of contribution, it was desirous of having a widespread participation in this plan. It pointed out that if one-third of the members would bequeath the Research Fund an average of \$100 each after a period of years there would be a sufficient sum available, so that income from it would be a real factor in promoting knowledge of materials.

As a result of this letter a number of members have made provision for contributions in their will, and a number of others are giving the matter consideration.

It is a source of gratification to the committee to report that three members have contributed outright the sum of \$100 each, this money having been deposited in the principal of the Research Fund.

With this encouragement as outlined above the Research Fund Committee plans to continue its work and solicits the cooperation of all Society members. It is acknowledged that an active Research Fund of reasonable proportions will multiply greatly the usefulness of the Society. The committee would be pleased to hear from any members who feel that they would like to assist in this worthy program.

Members will be interested in knowing that the Executive Committee of the Society has just allocated to the A.S.T.M. Research Fund the sum of \$2500. This sum is taken from reserve funds which have been accumulated in recent years and with other gifts will increase the principal of the fund to somewhat over \$10,000.

## Misprint in Proceedings

DURING the printing of Part I of the 1935 *Proceedings* a few copies of one section of the book were misprinted. While it is believed that most of the copies in which the misprinted pages appeared were detected prior to shipment, it is suggested that each member leaf through the section of Part I beginning with page 689 and extending to page 817 to see that the correct sequence of pages has been followed. Members who may have defective copies are requested to return them to Society Headquarters so that a perfect copy can be forwarded.

## Annual Meeting Technical Program

THE PRELIMINARY announcement appearing in the December BULLETIN of the development of the technical program for the 1936 annual meeting to be held at Chalfonte-Haddon Hall, Atlantic City, June 29 to July 3, indicated that one of the outstanding features was to be a Symposium on X-ray Crystallography and Radiography which is being developed under the auspices of the Society's Committee E-4 on Metallography. The symposium is to comprise twelve extensive technical papers, six in the section on radiography and six in the diffraction section. In addition to this outstanding symposium, the technical program will include what promises to be a most interesting group of papers on the Significance of Tests for Rubber Products and Their Correlation with Service Performance.

The Society's Committee D-11 on Rubber has for some time been considering the development of such a program and definite plans are under way to hold it this year. H. A. Depew, Research Chemist, American Zinc Sales Co., and Arthur W. Carpenter, Manager of Testing Labs., B. F. Goodrich Co., respectively chairman and secretary of Committee D-11, are soliciting the papers to be included. Tentative plans call for the discussion of the subject under five headings: Tires, Mechanical Goods (Belting and Hose), Insulated Wire and Cable, Boots and Shoes, and Automotive Parts. Prominent technologists in the rubber industry and those concerned with the use of these materials are being asked to prepare papers.

The committee hopes to give some indication of how far laboratory tests can be used in evaluating rubber products as to performance; that is, depending on the particular product and its use, is it considered reasonable and safe to depend on laboratory tests or is it necessary at least in large part to depend on service tests and the reputation of the manufacturer? The papers should be of widespread interest to a great many members because of the extensive use of rubber products in so many industries.

## National Smelting Company Sustaining Member

ANNOUNCEMENT is made of another Sustaining Member effective as of January, 1, 1936, this membership being that of the National Smelting Co., Cleveland, Ohio. This company which has been a member of the Society since 1919 will continue to be represented in their new classification by Mr. W. M. Weil, Treasurer.

It is significant that this organization is the first one from the non-ferrous metals field to subscribe to this class of membership which was established with annual dues of \$100 in order that those organizations wishing to, might support Society work to a degree somewhat more commensurate with the intrinsic value to them of A.S.T.M. standardization and research accomplishments.

Including the membership of the National Smelting Co., the number of sustaining members is now ten and it is hoped that during the year other organizations will consider the possibility of becoming sustaining members of the Society. It is planned to make appropriate contacts with a number of the larger industrial concerns in order that the mutual advantages of this additional Society support may be made clear.



## Abrasion Tests of Aggregate

MANY Society members, especially those who follow closely the activities of A.S.T.M. Committees D-4 on Road and Paving Materials and C-9 on Concrete and Concrete Aggregates, will doubtless be interested in a research program sponsored by the Project Committee on Correlation of Research in Mineral Aggregates, a division of the Highway Research Board of the National Research Council. This work involves a cooperative investigation involving comparisons of the Los Angeles and Deval abrasion tests of aggregate.

Considerable work has been done on the problem and at its recent meeting in Washington the Project Committee reviewed the data which have been submitted by the cooperating agencies.

The data indicate that although individual laboratories have little difficulty in duplicating results, there are certain details of the Los Angeles machine which if not standardized may cause variation of results between different laboratories. Cooperating organizations will study this phase and also a number of check tests on identical samples are to be made by several laboratories. At the 1935 A.S.T.M. meeting an interesting paper was presented by Messrs. D. O. Woolf and D. G. Runner of the Bureau of Public Roads on "The Los Angeles Abrasion Machine for Determining the Quality of Coarse Aggregate" and this is included in Part II of the 1935 *Proceedings*. A.S.T.M. Committees D-4 and C-9 which have been investigating the problem decided in view of the progress already made to publish as information a proposed method of test for abrasion of coarse aggregates based on the use of the Los Angeles machine. It is believed this test will eventually be substituted for the Standard Method of Test for Abrasion of Rock (D2-33) similar in almost all respects to the Deval abrasion test. Much of the work indicates that the Los Angeles test furnishes results which correlate better with the service behavior of aggregates in certain construction than do those resulting from the Deval test.

## Color Council to Meet

THE Inter-Society Color Council of which A.S.T.M. is a member will hold its annual meeting on Thursday, February 20, in the Astor Gallery of the Waldorf-Astoria Hotel, New York City. Following a brief business meeting the conference will be open to the members of the organizations that are members of or affiliated with the Council.

At this meeting, which will begin at 8 p. m., the Council will sponsor three lectures on color by representatives of the International Printing Ink Corp. and the Massachusetts Institute of Technology, as follows:

The Chemistry of Color—A. E. Gessler  
Color as Light—A. C. Hardy  
Color in Use—George Welp

Because of the widespread interest in these lectures with the possibility of a capacity attendance, the Council wishes to have information in advance from those who will attend. A.S.T.M. members who wish to attend the meeting are requested to notify the secretary, R. G. Macdonald, Technical Association of the Pulp and Paper Industry, 122 E. 42nd St., New York City, as soon as possible. Tickets will be distributed to those first notifying the secretary.

## Schedule of Meetings

DATE	COMMITTEE	PLACE
Week of February 17....	B-4 on Electrical-Heating, Electrical-Resistance and Electric-Furnace Alloys...	New York City
February 20....	Sectional Committee on Classification of Coals...	New York City
February 24....	E-6 on Papers and Publications .....	Philadelphia
March 11-13....	D-13 on Textile Materials...	Washington
•		
March 4.....	REGIONAL MEETING.....	Pittsburgh
March 2-6....	SPRING GROUP MEETINGS OF COMMITTEES.....	Pittsburgh
March 12....	CHICAGO DISTRICT MEETING .....	Chicago
June 29-July 3.	ANNUAL MEETING.....	Atlantic City

## Steel Subcommittees Meet

A WELL-ATTENDED and productive series of meetings of subcommittees of Committee A-1 on Steel were held in Philadelphia extending from January 20 through 22. In all eleven meetings were held. The subcommittees reviewed existing revisions in a number of the specifications in their charge and initiated action to incorporate these in the standards so that they may be published in the 1936 Book of A.S.T.M. Standards. A number of new specifications were studied, some of which are mentioned below.

Careful consideration by the subcommittee in charge indicated the desirability of incorporating extensive revisions in the standard specifications for structural nickel steel. These are set forth in the form of a new tentative standard. The committee took action to modify the present tentative revision of the finish clause requirements of the structural steel specifications, A 7, A 9 and A 94, to provide that an experienced mill inspector shall inspect the work after chipping operations and that the purchaser's inspector shall be given full opportunity to make the same inspection. New tentative specifications representing revisions of standards covering high-carbon and quenched high-carbon steel splice bars were approved and it is expected will be recommended for publication.

Three proposed specifications involving concrete reinforcement material were considered. These cover expanded metal, fabricated bar or rod mats and welded wire fabric. Two new specifications are to be submitted by Subcommittee IX covering 4 to 6 per cent chromium steel still tubes and heat exchanger and condenser tubes.

Extensive work which has been under way by Subcommittee XXII culminated in a decision to recommend the publication of proposed specifications covering nuts used in bolting for high-pressure and high-temperature service up to 1100 F. and alloy-steel bolting material for high-pressure and high-temperature service from room temperature to 1100 F.

Careful consideration by the subcommittee on commercial bar steels resulted in a decision to recommend extensive changes in the revisions of the cold-finished and hot-rolled bar specifications (A 107 and A 108), which revisions were published last year. Of much interest is the decision to simplify grade designations and eliminate a number of grades.



## VIII. Long-Time Society Committee Members

### *Eighth in the Series of Notes on Long-Time Members*

THERE ARE given below notes of the work of three long-time A.S.T.M. members, these notes being a continuation of the series of articles in the A.S.T.M. BULLETIN comprising reviews of outstanding activities of men who have been affiliated with the Society for 25 years or more and who have taken an active part in committee work.

W. K. HATT, Head, Department of Civil Engineering, Purdue University, is a graduate of the University of New Brunswick, Canada, having received his A.B. degree in 1887. He was awarded the C.E. degree by Cornell University in



W. K. Hatt

R. A. Bull

H. F. Moore

1891 and in 1901 the University of New Brunswick awarded him the Ph.D. degree. Following a period as professor of civil engineering at New Brunswick and instructor at Cornell, he became a member of the faculty at Purdue University. He was Professor of Applied Mechanics from 1901 to 1906 and since that time has been Professor of Civil Engineering and Director, Laboratory for Testing Materials. An outstanding expert in the field of reinforced concrete and materials of construction, he has rendered consulting service on a wide number of engineering projects involving flood prevention, building code work, patent suits, etc. From 1902 to 1908 he was in charge of Timber Tests, U. S. Forest Service.

Doctor Hatt is one of the few members of the Society who have been affiliated with it continuously since 1898. One of his early contributions to the Society literature was a report prepared in 1899, with Edgar Marburg, on impact tests. This was the fifth publication issued by the Society and a review of it indicates the thoroughness with which these two men who contributed so much to A.S.T.M. work investigated the subject. He was a member of Committee D-7 on Timber from its organization in 1904 to 1921 and was its first secretary, serving from 1906 to 1915.

He was active especially in the early years in the work of a number of committees including the groups on cast iron and brick and served on Committee E-1 on Methods of Testing from its organization in 1904 through 1919. Doctor Hatt has served two terms on the A.S.T.M. Executive Committee, 1915 to 1917 and 1922 to 1924.

R. A. BULL, Consultant on Steel Castings, received his education at Butler University, A.B., and St. Louis University, A.M. After a period of service as Chief Inspector for various companies, he was General Foreman for Leighton and Howard Steel Co. He then entered the employ of the American Steel Foundries and became Manager of the Order

Department. Later he was General Superintendent for the Commonwealth Steel Co. and then Vice-President and General Manager of the Chicago Steel Foundry Co. He held these same positions when he was with the Duquesne Steel Foundry Co.

For a number of years Mr. Bull was Director of the Electric Steel Founders' Research Group. In March, 1917, he was commissioned Major, Ordnance Dept., U.S.A., serving until February, 1919, mostly in France.

Mr. Bull has been affiliated with A.S.T.M. since 1908. He has been a member of Committee A-1 on Steel since 1921 and holds membership on Committee A-10 on Iron-Chromium, Iron-Chromium-Nickel and Related Alloys. He is a representative of the Society on the Joint Research Committee on Effect of Temperature on the Properties of Metals, and for many years has been a member of the Joint Committee on Phosphorus and Sulfur in Steel. Mr. Bull is also serving as a member of the Chicago District Committee.

One of his most valuable contributions to A.S.T.M. work has been in connection with the development of specifications for steel castings through Committee A-1 on Steel.

An outstanding authority in his chosen field, Mr. Bull in 1927 received the Joseph S. Seaman Medal of the American Foundrymen's Assn. for his "contributions to the association and to the foundry industry." He was president of this association for two terms—1915 and 1916.

H. F. MOORE, Professor of Engineering Materials, University of Illinois, is a graduate of the University of New Hampshire, B.S., 1898, and Cornell University, M.E. and Master of Mechanical Engineering. In 1922 the University of New Hampshire awarded him the honorary degree of Doctor of Science. After serving as instructor at Cornell and later as mechanical engineer with Riehle Brothers Testing Machine Co., he was Instructor and Assistant Professor of Mechanics, in charge of Materials Laboratory, University of Wisconsin, 1904-1907. Since this time he has been at the University of Illinois.

Professor Moore has designed various machines for testing strength of materials and for measuring minute changes of form under stress. While perhaps most renowned for his extensive work on fatigue of metals, he has been active in a number of other fields and at the present time is heading up the important work being carried on investigating rail failures.

A member of the Society since 1903, he served on the A.S.T.M. Executive Committee from 1919 to 1921; Vice-President, 1925-1927, and President, 1927-1928. One phase of Professor Moore's valuable work for the Society has been in connection with the activities of Committee E-1 on Methods of Testing, of which he has been a member for about 20 years. He is present chairman of the Subcommittees on Mechanical Testing and Calibration of Testing Machines. He has served as chairman of the Research Committee on Fatigue of Metals since its organization in 1928 and was the first chairman of the Society's Committee E-9 on Research, serving for ten years until 1934.



## Society Activities in 1936

(Continued from page 4)

new failures were observed in the No. 16 gage copper-bearing and non-copper-bearing sheet steel specimens immersed in sea water at Portsmouth, N. H., and Key West, Fla. These tests have now been under way since 1927 and of the 138 specimens exposed at each of the two locations, the failures at Portsmouth total 106 and at Key West 87.

Periodic inspections of the galvanized sheet specimens exposed at five test locations for over 8 yr. have been reported. All coatings on the Brunot Island (Pittsburgh), Pa., test rack have now failed. Failure of coatings on all of the galvanized sheets at Altoona, Pa., was reported in 1934. Tests at the other three locations, Sandy Hook, N. J., State College, Pa., and Key West, Fla., are still continuing. The data reported presents a concise picture of the progressive deterioration of the galvanizing on these sheet specimens.

The committee has reported an extensive tabulation of the inspections of the comprehensive series of exposure tests on eight types of metallic coatings applied to specimens of hardware, structural shapes, tubular goods, etc., which have now been under way at five test locations for almost 6 yr. The results tabulated show that in most cases the proportion of the exposed surface of the specimens covered with rust has increased but that the additional rusting does not appear to have altered previous indications of the data. An extension of the hardware tests is planned designed to supplement the earlier tests of sherardized, electroplated and hot-dipped zinc-coated products. In these additional tests, parts of similar shapes will be given comparable coating weights of zinc applied by the above three methods.

The committee is rapidly furthering its Wire Test Program and hopes to have the erection of the wire and fence samples completed early this year.

An important contribution this year was the publication as tentative of three specifications for electrodeposited coatings on steel, covering respectively, zinc, cadmium, and nickel and chromium coatings. These specifications were prepared under the joint cooperation of the American Electro-Platers' Society, the National Bureau of Standards and the A.S.T.M.

A revised draft of the Preece test used for determining the uniformity of coating on iron and steel wire has been completed. Stripping methods for electrodeposited coatings are being studied to standardize methods for stripping the electrodeposited coatings now covered by tentative specifications. A subcommittee is actively studying stripping methods for removing the coating from heavily galvanized hardware and for determining the area of irregularly shaped heavy hardware parts.

### Corrosion of Non-Ferrous Metals and Alloys

Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys tabulated and summarized in its 1935 report the results of atmospheric corrosion tests on 24 non-ferrous metals and alloys after an exposure of approximately 3 yr., in addition to studies of liquid corrosion in sodium chloride, sodium hydroxide and sulfuric acid, and the corrosion behavior of galvanic couples in outdoor atmospheres over a period of 3 yr.

Criteria used in judging the extent of the corrosion of the atmospheric specimens were (a) change in weight on duplicate 9 by 12-in. plates, (b) tests to find changes in tensile strength and percentage elongation, and (c) visual examination of the 9 by 12-in. plates. A statistical analysis has been made of data from both the 1-yr. and 3-yr. exposure tests. This study was made to determine what part of the changes in the tensile properties are due to chance variations. The data indicate that so far only a few of the materials have experienced a large amount of corrosion in either the industrial or marine atmospheres. The corrosion of all metals and alloys was negligible in rural atmospheres. However, in many cases sufficient corrosion has occurred to permit rough classifications of the materials into several groups based on their corrodibility as indicated by the data on tensile properties.

The 3-yr. data on the galvanic couples have indicated that changes of sufficient magnitude have developed in several cases to justify tentative conclusions relative to the behavior of some of the metals when in contact with other metals at particular exposures. In most instances, the 3-yr. data, when compared with the 1-yr. results, show a consistent behavior for specific metals in a given type of exposure, while in a few cases there are minor inconsistencies, which are probably within the chance variables of the test.

### Corrosion of Screen Wire Cloth

The exposure test program has been the principal activity of Committee D-14 on Screen Wire Cloth. A detailed report of these tests after 9-yr. exposure has been presented in a paper by G. W. Quick on "Atmospheric Exposure Tests on Non-Ferrous Screen Wire Cloth." Seven non-ferrous materials in the form of 16-mesh insect-screen cloth woven from wire 0.0113 in. in diameter were exposed at four test locations selected to represent different atmospheric conditions as follows: (1) The Bureau of Mines at Pittsburgh, a "heavy" industrial atmosphere; (2) the Lighthouse Depot at Portsmouth, Va., a temperate seacoast atmosphere with some industrial contamination; (3) Cristobal, a tropical seacoast with some industrial contamination; and (4) the National Bureau of Standards, Washington, a normal inland atmosphere. In the mildly corrosive atmosphere at Washington, no failures occurred in any of the materials during the approximately 9-yr. period. In the temperate and tropical seacoast atmospheres of Portsmouth and Cristobal, with some industrial contamination at both exposure stations, there was more damage to each material than at Washington. The severest damage to each material was caused by the heavy industrial atmosphere at Pittsburgh.

### Iron-Chromium-Nickel Alloys

The development and recent wide application of the so-called "stainless" or corrosion-resisting steels has made the standardization work of Committee A-10 on Iron-Chromium, Iron-Chromium-Nickel and Related Alloys particularly important. In response to the industrial demand for purchase specifications for these chromium-bearing steels the committee completed three specifications for corrosion-resisting sheet, strip and plate covering, respectively, chromium steel, chromium-nickel steels and high-strength chromium-nickel steels. These include the 18 per cent chromium, 8 per cent



nickel type steels. The committee also completed three new tentative specifications for chromium steel castings and five specifications for chromium-nickel steel castings which include materials suitable for corrosion-resisting and heat-resisting applications.

### **Metallography**

Committee E-4 on Metallography presented to the Society a tentative recommended practice for metallographic testing of both ferrous and non-ferrous metals which brings together in a very compact and usable form a most complete treatise on this subject. Two of the E-4 subcommittees are cooperating in revising certain nomenclature and definitions, particularly as applied to photography, and this work should be completed during the year. A special subcommittee has been appointed to give further consideration to the standard grain-size charts for classification of steels in order to make this standard more definite in its scope and preferably without unduly limiting its application. Committee E-4 hopes to be able to have some work started under a special subcommittee on the structure of tool steels before the close of the year.

### **Spectrographic Analysis**

Committee E-2 on Spectrographic Analysis has made splendid progress in furthering its program of work since its organization in 1932. Three new quantitative methods of spectrochemical analysis were issued as tentative, covering the analysis of high-grade pig lead for copper, bismuth, silver and nickel; of zinc for lead, iron and cadmium; and of zinc alloy die-castings for minor constituents and impurities.

The committee is obtaining by means of a questionnaire information on the essential details of procedure used in various commercial and university laboratories, the accuracy and precision of the results obtainable by the various methods, and other details that will aid it in its studies.

The committee has also been active in gathering information with regard to available sources, both of pure metals as free as possible from contaminating elements and of commercial grades of metals which have been analyzed with care so that they may be used as standard samples on which to base the quantitative spectrographic methods.

The Symposium on Spectrographic Analysis held at the 1935 annual meeting was arranged by Committee E-2. The objectives of the six papers comprising the symposium were to provide information as to spectrographic methods for control of quality of materials in a variety of industries and to show the possibilities of securing more rapid and reliable methods of obtaining definite information as to composition of materials. It was hoped through the symposium to create a wider interest and confidence in spectrographic methods for the enforcement of the Society's specifications.

### **Copper Wire; Non-Ferrous Metals**

Important changes were made this year by Committee B-1 on Copper Wire in the specifications for bare concentric-lay copper cable and for bronze trolley wire. A new stranding table for concentric-lay cable was added to the former specification, certain restrictions have been placed on the use of brazes in hard- and medium-hard drawn bare conductor for overhead lines, and requirements have been added for testing cable in its completed form. With the joint cooperation

of the Association of American Railroads and the American Transit Engineering Association the trolley wire specifications were revised to include a third class of bronze wire having a higher conductivity than the two present classes. Basic data are now being accumulated by the committee as to the effect of soft *versus* hard center wires in hard-drawn concentric copper transmission cables which will permit of a revision in the existing specifications this year.

Committee B-2 on Non-Ferrous Metals and Alloys presented as tentative, specifications for lead-coated copper sheets for architectural uses and advanced to standard its specifications for pig lead and methods of chemical analysis of aluminum and its alloys. In order that the existing specifications for slab zinc (spelter) will conform to present-day practice, especially as regards zinc of extreme purity, the committee presented for publication as tentative a revision of this standard specification.

### **Copper Alloys**

Committee B-5 on Copper and Copper Alloys, Cast and Wrought presented specifications for copper-silicon alloy wire which completes a set of four specifications for products of this copper alloy. This wire is well adapted for making bolts, screws, nails, rivets, springs or other structural members requiring a material of high strength and good corrosion resistance.

In response to a demand for guidance in the use of wrought metal as an alternative to the cast metal heretofore specified for bridge bearing and expansion plates, Committee B-5 prepared specifications for the wrought phosphor bronze and silicon bronze materials. The former was accepted for publication as tentative by the Society and both specifications are now being carefully studied by Committee B-5 in cooperation with representatives of the American Association of State Highway Officials and the American Railway Engineering Association. The specifications for cast bronze bearing metals are also being given a thorough study.

### **Electrical-Resistance Alloys**

Committee B-4 on Electrical-Heating, Electrical-Resistance and Electric-Furnace Alloys has cooperated with the Joint Research Committee on Effect of Temperature on the Properties of Metals in developing high-temperature test methods. The recommended foundry practice for casting the tension test specimen for use at temperatures up to 1000 C. has been improved to secure sound castings. Work is proceeding in developing the bend test to indicate the deformation and load-carrying capacity of structural materials at high temperatures. The warpage test specimen is being tried with various materials to determine their relative tendency to warp.

A study of several methods of test for thermostatic metals has been made and the test for deflectivity is being tried.

The improvement in quality of the nickel-chromium heater alloys has so increased the time required in the accelerated life test that steps are being taken to increase the temperature in the test. Some improvements in details also are being made. A life test is being developed for the new alloys such as chromium-iron-aluminum which are intended particularly for electric furnaces, to determine their life at temperatures up to 2600 F.

Cooperative work is being carried on with the Magnet



Wire Committee of the Sectional Committee on Insulated Wires and Cables to develop a standard test for determining the stiffness of resistance wires and magnet wires. Comparative tests have been made with several different types of machines for this purpose.

### **Die Castings**

Committee B-6 on Die-Cast Metals and Alloys added another tentative specification to its list of four standards for die castings, this new addition covering the lead and tin-base alloy castings.

The committee has been studying an improved aluminum die-casting alloy of the 12 per cent silicon type corresponding to Grades IV and V of the existing specifications for aluminum alloy die castings but of higher purity with narrow composition ranges. Chemical analysis and tests of the original mechanical properties of the alloys have been completed and are reported. Subsequent reports will cover the accelerated and atmospheric corrosion tests.

Committee B-6 presented a comprehensive report covering the extensive results obtained after 5-yr. exposure of the 12 aluminum and 10 zinc alloys cast by several producers and exposed at six outdoor and four indoor test locations. All outdoor exposure specimens were photographed after 4-yr. exposure and the report includes a description of the general surface appearance of each alloy at each of the six locations. The report includes the data from all laboratories which comprise coordinated chemical analysis, tensile strength, elongation and impact strength. A discussion of the data is presented for both the aluminum and zinc alloys. The tests are being continued.

### **Fatigue; Effect of Temperature**

The Research Committee on Fatigue of Metals has been considering, in cooperation with Committee E-4 on Metallography, the use of the X-ray as a means of detecting impending fatigue failure in metallic materials. The most common test for fatigue strength of metals in use at present is the rotating-beam test in which a transverse load on a rotating specimen sets up a cycle of reversed flexural stress for every revolution of the specimen. The Research Committee has prepared a set of notes on this test which includes machines of either the centrally loaded or cantilever type.

The Joint Research Committee on Effect of Temperature on the Properties of Metals has continued its sponsored research at Battelle Memorial Institute. The study of the progressive changes in toughness of an austenitic steel when exposed for long periods to high temperatures, both with and without stress, was completed during the year and is described in a report by H. C. Cross and F. B. Dahle. Due to the increasing number of processes carried out at sub-atmospheric temperatures, a new subcommittee has been organized to consider the effects of low temperatures on metals. The subcommittee contemplates preparation of a bibliography and expects to consider the preparation of specifications for making low-temperature mechanical tests.

### **Cement**

Committee C-1 on Cement reported the completion of a program of tests on 34 brands of high-early-strength cements. Four laboratories participated in this investigation which included subsieve fineness tests, the present stand-

ard tension test briquets, 6 by 12-in. concrete cylinders, and plastic mortar cubes, the latter prepared in accordance with the tentative method of test for compressive strength of portland cement mortars.

The tentative specifications for high-early-strength portland cement have been given further study. At its recent meeting Committee C-1 decided that, subject to favorable letter ballot, it would submit to the Society for adoption in June a very recently proposed revision of these specifications. The revision includes, in addition to minor changes, a specific surface fineness requirement based on turbidimeter tests, and also two alternate strength tests—tensile and compressive. The tensile strength requirements are the same as now in effect. The compressive strength requirements are based on the results of the above-mentioned investigation of 34 cements and specify 2-in. mortar cubes. The committee has also agreed that, subject to favorable letter ballot, there be submitted to the Society as tentative a specification for high-early-strength treated portland cement.

With the assistance of a large number of laboratories, a further study of quick methods of determining the magnesia content in portland cement was completed subsequent to the June meeting. As a result, two recommended rapid methods, substantially as presented with the 1935 report of C-1, were accepted by the Society through Committee E-10 on Standards for inclusion in the tentative method of chemical analysis of portland cement. Studies are now being made on methods of determining manganese, ferrous oxide and phosphorus in portland cement.

No revisions have been recommended recently in the standard specifications for portland cement but keen interest is being expressed on such subjects as substitution of a specific surface requirement for the present sieve fineness test, attainment of more information concerning variables involved in the turbidimeter tests, and development of a more indicative soundness test. Work is now being done on the turbidimeter problems.

### **Concrete and Concrete Aggregates; Pipe**

Committee C-9 on Concrete and Concrete Aggregates completed a new compression test for concrete using portions of beams broken in flexure, a method of determining voids in coarse aggregates, and a test for the amount of material finer than No. 200 sieve in aggregates. This latter method was prepared in cooperation with Committee D-4 on Road and Paving Materials and is intended to supersede the existing decantation methods. The specifications for ready-mixed concrete were adopted as standard, the soundness tests for fine and coarse aggregates were revised to include the use of magnesium sulfate, and a revision in the sieve analysis test for concrete aggregates was proposed.

Included in the comprehensive program of work which Committee C-9 has undertaken are the following projects which may be reported on this year: Definitions relating to concrete and concrete aggregates; test for flow of concrete by use of the flow table; transverse tests of concrete; test for abrasion of aggregates by use of the Los Angeles rattler; test for coal and lignite in sand; method of analysis for determining the uniformity of fresh concrete.

Committee C-13 on Concrete Pipe completed new tentative specifications for concrete irrigation pipe and adopted as



standard the two specifications for concrete sewer pipe covering respectively the non-reinforced and the reinforced pipe. A number of improvements were also made in the specifications for reinforced-concrete culvert pipe which are being continued as tentative.

### **Brick; Clay Pipe; Refractories**

The weathering and porosity studies of brick made by Committee C-3 have resulted in the introduction of a method for determining the weathering resistance and durability of clay building brick. This work is described in the current report which includes papers by D. E. Parsons on "Comparison of Natural Weathering with Laboratory Tests of Clay Brick" and by J. W. McBurney on "The Relation of Freezing-and-Thawing Resistance to Physical Properties of Clay and Shale Building Brick." A revision of the existing standard methods of testing brick which has been issued as tentative includes this new weathering test.

A tentative revision of the standard specifications for clay building brick has also been issued and includes provisions for affording the consumer protection as regards factors of weathering and durability of brick. A subcommittee has been appointed to draw up a tentative specification for glazed and enameled brick.

Many manufacturers are now de-airing the clay used in the manufacture of paving brick which has resulted in a marked change in the physical properties of their product. Because of this, the subcommittee on paving brick is considering a revision of the specifications based on investigational work being conducted in the laboratories of the U. S. Bureau of Public Roads.

Committee C-4 on Clay Pipe adopted as standard this year revised specifications for clay sewer pipe which replace the former standard. A complete revision of the numerous definitions of terms referring to clay sewer pipe and pipe materials was completed and published as tentative. These are intended to eventually supersede the present standard definitions on this subject.

Committee C-8 on Refractories adopted as standard methods of chemical analysis of magnesite refractories, a test for Pyrometric Cone Equivalent, definitions for clay refractories, and issued several new tentative definitions of refractories.

The committee is studying the desirability of establishing a new series of Standard Pyrometric Cones used for tests of refractories with uniform temperature intervals from cones Nos. 19 to 42 and is undertaking an industrial survey of the service conditions to which refractories are subjected in the glass industry. Considerable work has been done by the committee in studying various methods of determining heat conductivity of refractory materials and additional cooperative tests are to be undertaken to determine the closeness with which laboratories are able to duplicate results for thermal conductivity of insulating fire brick.

### **Masonry Building Units**

Committee C-10 on Hollow Masonry Building Units has undertaken a study of the method proposed by Committee C-3 on Brick, as mentioned above, for classifying clay building brick in accordance with their weathering properties, in

order to determine whether the methods are applicable to structural clay tile. Consideration is being given to the preparation of detailed specifications for fireproofing tile since the existing specifications for non-load-bearing tile refers to this type of tile but does not contain detailed requirements for it. The committee is also giving its attention to further improvements in the specifications for clay floor and load-bearing wall tile and to definitions of structural clay tile.

### **Fire Tests**

The activities of Committee C-5 on Fire Tests of Materials and Construction are still seriously retarded since it has not been feasible to hold meetings that would be sufficiently well attended. The subcommittee which has been endeavoring to formulate suitable tests for doors as protectives on interior wall openings is studying the possibility of separate specifications based on material (metal or treated wood), construction (solid, hollow or metal covered), operation (swinging, folding or rolling), and purpose (fire-retardant, heat-insulating or smoke-proof). While the subcommittee itself is not conducting tests, it has had made available to it the results of recent commercial tests.

The subcommittee on tests of treated wood is confronted with the problem of choosing between several methods of test. Comparative studies have been made by different investigators but no conclusions have yet been arrived at. It is expected that an extensive investigation in prospect at the Forest Products Laboratory will assist in a determination. The subcommittee on tests for scaffolds has outlined, for purposes of discussion, a tentative draft of a specification for fire-retardant wood scaffolding, the material still in most general use.

### **Timber; Shipping Containers**

Committee D-7 on Timber made further improvements in the tentative specifications for timber piles which are now being considered for adoption as standard. Specifications for creosote and creosote-coal tar solution were adopted resulting in uniform standards for these materials on the part of the American Railway Engineering Association, the American Wood Preservers' Association and the A.S.T.M.

Under the joint cooperation of the A.R.E.A., the American Association of State Highway Officials, and Committee D-7 representing A.S.T.M., a proposed revision of the specifications for structural lumber and timber has been prepared and published as information. The proposed revision does not change the principles underlying the present standard but represents primarily a rearrangement of the material and the substitution of stress values for the grade names in the existing specifications. This simplification is expected to result in a more extended use of the specifications.

Committee D-10 on Shipping Containers has decided to drop any further work towards preparing specifications for containers and will devote its time to preparing procedures for making tests on the materials and accessories used in the construction of containers, the designing or acceptance of apparatus for making these tests, and the procedures to be followed in making tests of the completed containers. The committee accordingly recommended the withdrawal of its four existing specifications for wood shipping containers.



## **Preservative Coatings; Naval Stores**

Committee D-1 on Preservative Coatings for Structural Materials contributed, as usual, a number of tentative standards. These comprised specifications for blue lead (basic sulfate); and for wood panels for accelerated weather tests of paints and varnishes; also methods of test for hiding power of white pigments and procedures for determining acid number, alkali resistance and skinning of varnish.

The committee has been considering tests for paints when immersed in liquids and has prepared a statement discussing the principles of testing paints and combinations of paints on steel panels with particular reference to submerged conditions.

The program of the subcommittee on accelerated tests for protective coatings embraces work with house paints, varnishes, lacquers and metal protective paints. It is the committee's intention to try to interpret results obtained through accelerated methods in terms of failure under conditions of normal exterior exposure. It is realized that so-called accelerated weathering tests might be successfully supplemented or even replaced by certain physical tests that indicate the course of changes in the properties of protective coatings. Since such tests might be useful for accelerated testing purposes, it is the intention of certain groups within this committee to carry on such work in addition to their other activities.

This committee will work during the coming year on the development of new hiding power charts for one-coat hiding power determinations. It is the general opinion of the group at work on this subject that an incomplete hiding test involving the use of a standard paint or standard brush-out submitted by the buyer would prove to be the most universally applicable method.

The subcommittee on varnish is undertaking a study of methods for determining the reactivity of varnishes, the development of standard adhesion tests, the effect of temperature, humidity and other factors upon the physical properties of varnishes, and a study of methods for evaluating failures of varnishes upon exposure.

Because of the present international interest in test methods and specifications for shellac, an extensive program of work has been prepared for the coming year.

Committee D-17 on Naval Stores has been cooperating with Committee E-1 on the development of an improved ring-and-ball method for determining softening point. Studies of the falling ball viscosity method indicate that this method does not hold much promise of being developed to replace methods like the ring-and-ball test. The committee is cooperating with Committee D-1 and the Association of Official Agricultural Chemists in the development of tests for solvency, evaporation rate and evaporation residue. Work of the various subcommittees on viscosity of rosin, crystallization, size making value and alum test, on acid and saponification number and unsaponifiable matter, and on darkening and volatility on heating is being continued.

## **Petroleum Products**

Committee D-2 on Petroleum Products and Lubricants developed a new tentative method of test for vapor pressure of motor and aviation gasoline (Reid method). This method was prepared since the existing method of test for vapor

pressure, while developed originally for natural gasoline, had been widely used for motor and aviation gasolines. The new method represents an improvement in the test as applied to these products.

The method of test for viscosity by means of the Saybolt viscosimeter was rewritten to define the procedure more closely and thus to improve the reproducibility of results, and it is expected that the new method will eventually replace the present standard. The test for flash point using the Tag closed tester was also completely rewritten and includes provisions for testing lacquer solvents or diluents of low flash point. A procedure for flash point of cut-back asphalts and other viscous materials and suspensions of solids was issued as a tentative revision of the standard method which uses the Pensky-Martens closed tester.

A revision of the classification of Diesel fuels was published as information. Data on the reproducibility of results obtained with the Sligh oxidation test was included in the annual report together with the proposed method of test for oxidation number.

Two new subcommittees are being organized, one on plant spray oils which will standardize various tests for these products, and the second on illuminating oils to which has been assigned the task of modifying the present burning test methods for illuminating oils to overcome the difficulties now being encountered in obtaining apparatus conforming to the present specifications.

The subcommittee on corrosion test for lubricating oils has developed a cooperative test program using a testing machine in which oil is held at a predetermined temperature and pumped in small streams on bearings of various compositions. An attempt will be made to find test conditions which will yield results that may be correlated with performance in service in automobile engines.

The subcommittee on grease plans to develop a method for the determination of the dropping point of grease. Based on cooperative tests, it has been decided to submit the method using a special kind of copper wire to the committee members for criticism.

In connection with work on turbine oils, the committee plans to collect information from operating companies on tests employed to evaluate and differentiate turbine oils and to correlate the information so obtained.

Other projects under way in the committee include the preparation of a general specification for gasoline with suitable variations for climatic conditions, consideration of possible modifications of the tentative specifications for fuel oil, and the development of specifications for Diesel fuels from the classification that has already been printed. Two new sections of the subcommittee on motor oils are being organized, one on extreme-pressure lubricants and one on oiliness of motor oils.

## **Road Materials**

Committee D-4 on Road and Paving Materials completed a group of methods of sampling and testing soils which includes procedures for surveying soils and preparing samples, mechanical analysis, liquid and plastic limits, centrifuge and field moisture equivalents, and shrinkage factors. In cooperation with Committee D-8, a volume correction table for asphaltic products was tentatively approved, and the com-



mittee joined with committee C-9 in developing the test for amount of material finer than No. 200 sieve in aggregates. The test for ductility of bituminous materials was adopted as standard, and revisions were made in the emulsified asphalt test methods and the test for residue of specified penetration. The committee is studying the Los Angeles abrasion test for coarse aggregates which may eventually replace the present standard Deval abrasion test. A draft of the new method was published as information.

### **Waterproofing and Roofing Materials**

Committee D-8 on Waterproofing and Roofing Materials made extensive improvements in four existing tentative specifications for surfaced asphalt roofing, and modified the specifications for asphalt used in built-up roof coverings and the test for coarse particles in bituminous materials. Results have been reported of further studies of the accelerated weathering tests of bituminous materials for the purpose of standardizing the carbon arc lamp. The tests so far have established the usefulness and reliability of the proposed accelerated test method published as information two years ago but certain refinements will be necessary including controlled conditions of light, temperature and humidity before it is submitted as tentative.

The new subcommittee on mineral surfaces for roofing materials is studying five existing methods for determining adhesion of roofing granules to asphalt coatings in order to prepare a standard test procedure. Screen tests for ground mica and for roofing granules are in preparation and the committee is considering undertaking a study of permanence of roofing granules on exposure to the weather. Other projects now under development by the committee include formulation of methods of test for bituminous coatings for cold application, revision of the analytical tests for membrane materials, further changes in the roofing specifications to include criteria for satisfactory filling materials, and additional tests for bituminous emulsions.

### **Coal and Coke**

Committee D-5 on Coal and Coke presented as tentative two optional tests for grindability of coal, namely, the ball-mill and the Hardgrove-machine methods. While further investigations are being made to determine which of the methods is the more accurate, it is proposed to let industry try them for several years before a decision is made as to which is the more suitable for evaluating coal grindability. A method of test for screen analysis of coal was also issued as tentative. This method covers the size testing of all coal except anthracite, powdered coal as used in boiler plants, and crushed coal as charged into coke ovens, since methods for size testing of these have already been standardized. The committee completed new tentative definitions of the terms "gross calorific value" and "net calorific value."

Satisfactory progress has been made in the studies of methods for measuring coal friability and it is probable that this test will be standardized during the coming year. Active work is in progress by the subcommittee on mechanical sampling and reduction of samples in standardizing a method

for mechanical reduction of gross samples of coal to convenient size for transmittal to the laboratory. The subcommittee is also formulating fundamental considerations that should govern collection of gross samples of coal by mechanical methods.

A new subcommittee was organized to investigate methods for determining dustiness of coal and coke with a view of developing a standardized test procedure. Such a method should prove useful in determining the efficiency of various methods of treating coal and coke with oil compounds or chemicals such as calcium chloride to prevent the fuel from dusting when handled.

The Sectional Committee on Classification of Coals recommended that the boundary line between low and medium volatile bituminous coal, as given in the tentative specifications for classification of coals by rank, be changed from 77 to 78 per cent fixed carbon. This recommendation was based on a statistical study of analyses of low and medium volatile coals from the various fields of the United States, and of the relation of the percentage of volatile matter to the industrial and domestic uses of these coals. Satisfactory progress is being made in developing a method for describing the size-range of any sample of coal from its screen analysis.

Active work is in progress regarding the application of laboratory tests to the selection of coal for various uses. The subcommittee on correlation of scientific classification with use classification has prepared seven comprehensive charts giving factors that should be considered in the selection of coal for different uses. These charts have been published by the National Committee on Coal of the National Association of Purchasing Agents, *Publication No. 21*, "Factors Recommended for Consideration in the Selection of Coal." The cooperation of fuel experts experienced in the use of coal for specific purposes is being solicited to designate on the charts those properties of coal of importance for each specific use, and to rate the relative importance of these properties.

### **Electrical Insulating Materials**

Committee D-9 on Electrical Insulating Materials contributed a new test for polymerization time of shellac for insulating purposes which gives an indication of the curing time and whether the shellac will cure properly. The committee again made extensive improvements in a number of its tentative methods of testing electrical insulation.

Studies are being made of the flow characteristics of shellac and the viscosity of insulating varnishes. Tests for saturant varnishes used for impregnating paper and cotton wound coils for electrical apparatus are being investigated.

A test for cure of molded insulating materials is being actively studied and methods for impact fatigue, shrinkage and warpage measurements are on the program for development. Studies of tests for plates, rods and tubes include arc-resistance, application of "hot" Rockwell hardness test to measurement of punching qualities and thickness tests of wide sheets and plates.

A program of tests for cable oils recently undertaken includes aging and oxidation, power factor, gas content of oils, viscosity, and power factor of treated papers.



Studies of tests for insulating mineral oils include neutralization number by electrometric titration, steam emulsion, sludge test, Slight oxidation, and dielectric strength. Consideration is being given to tests which may be necessary on insulating apparatus manufactured from glass. The methods of testing electrical insulating materials for power factor and dielectric constant have been extensively revised and will include procedures for tests at frequencies from 25 cycles to 1 megacycle per second. Methods of test for conducting paths in slate have been prepared to replace the existing methods. Studies of insulating papers and fabrics include tests for acidity characteristics by potassium chloride method, oil penetration characteristics of paper, correlation of elongation tests of treated fabrics with field experience, and power factor of varnished tape.

A special subcommittee on conditioning has undertaken an active program and has already submitted material discussing several methods of obtaining humidified atmospheres for conditioning test specimens. It is planned to include in these conditioning studies all pre-test conditioning requirements as well as service conditioning requirements.

### **Textile Materials**

Committee D-13 on Textile Materials adopted as standard the specifications for holland cloth and approved changes in its tentative specifications for rayon, tubular sleeving and braids, woolen and worsted yarns. The "S" and "Z" definition for direction of twist in yarns adopted by the committee is receiving international recognition. Changes were adopted in tentative methods for hard scoured wool in wool in the grease, identification of textile fibers and quantitative analysis of textiles and in the standard specifications for textile testing machines, tire cord, hose and belt ducks, cotton sewing thread and general methods of testing. Tentative methods of test for properties of cotton fibers, shrinkage in laundering of silk and rayon woven broad goods, wet strength of rayon woven fabric, pile floor covering and fineness of wool were issued.

Proposed methods of test for slippage in silk and rayon woven broad goods and fastness of dyed or printed cotton goods have been published as information in the compilation of A.S.T.M. Standards on Textile Materials.

This book has been completely revised and contains among other features a yarn number conversion table, abstracts of papers presented before the committee and a new set of photomicrographs of textile fibers considered by many as the best so far published.

The committee has been very active and has many important matters under consideration such as specifications for testing machines other than tensile testers, tolerances for relative humidity and temperature in defining the standard atmosphere, rate of moisture pickup, effect of regain on physical properties, determination of size and finishing materials, test methods for magnetic iron in asbestos textiles, electrical resistivity of asbestos textiles, dye fastness of silk and rayon goods, methods of classifying wool fibers, test methods for wool felt, specifications for wool fabrics, utility tests for pile floor coverings, performance tests for rayon

fabrics, standard terminology for fabrics, and methods for measurement of thickness.

### **Methods of Testing**

Committee E-1 on Methods of Testing has recognized the importance of proper designation and the interpretation of numerical requirements in Society standards and has organized a new subcommittee to consider methods of expressing requirements for chemical and physical properties in standards, permissible tolerances in test procedures and interpretation of specification requirements from the standpoint of acceptance or rejection of material. As a guide in undertaking this work this subcommittee is reviewing existing A.S.T.M. standards with regard to the designation and the intent of commercial requirements.

A cooperative series of tests by eight laboratories has been reported on a study of a microscopic count method of particle size measurement. A draft of the proposed method which applies to materials in which the particles are 2 microns or less in size has been published as information.

Considerable work has been done toward perfecting the ring-and-ball method for softening point so that it will be generally applicable to testing asphalts, tars, pitches, rosins and most resins, both natural and synthetic. Certain features of the apparatus and details of the procedure are now the subject of experimental study following earlier investigative work during which several drafts of the method were prepared. It is hoped that with the completion of the present studies the revised method will be ready for presentation to the Society.

### **Water for Industrial Uses**

Committee D-19 on Water for Industrial Uses has made considerable progress since its organization in 1932 in perfecting and furthering a number of important sections of its program of work. The methods for the analysis of the phosphate, carbonate, hydroxide and sulfate ions in boiler water which have been under consideration are now being edited for presentation to the Society in June. These methods were formulated from the results of research completed by a subcommittee of the Joint Research Committee on Boiler Feed Water Studies.

In order to focus attention on important fundamental considerations in sampling water, the committee published as information a report on "Problems in the Standardization of Methods for Sampling Water for Industrial Purposes." For its initial report the committee will consider the sampling of water in the liquid state, and will defer to a later date the subject matter of sampling in the plant, that is, from equipment, and subsequently will consider field sampling, that is, from streams, ponds, lakes and oceans.

The subcommittee on methods of analysis has prepared for discussion methods for the determination of chloride and calcium and magnesium ions in water. These methods may be ready this year for submission to the Society. The subcommittee is withholding its activity on the method for dissolved oxygen, pending the completion of the investigation on this subject by the Joint Research Committee. It is believed that the literature investigation on the subject of pH will take a considerable period.



## NEW MEMBERS TO JANUARY 29

The following 70 members were elected from December 10 to January 29, 1936:

### Company Members (14)

AMERICAN HAIR AND FELT CO., H. R. Zinn, Engineer, 139 Lockwood St., Newark, N. J.  
 AURORA METAL CO., Gustav Thurnauer, President, 614 West Park Ave., Aurora, Ill.  
 BEMIS INDUSTRIES, INC., J. E. Burchard, Vice-President, 40 Central St., Boston, Mass.  
 CANADIAN INDUSTRIAL ALCOHOL CO., LTD., R. Douglas Bennett, Director of Research, Corbyville, Ont., Canada.  
 DELAWARE ALLOY FORGE CO., H. R. Scott, President, 2300 E. Tioga St., Philadelphia, Pa.  
 DETROIT LUBRICATOR CO., H. M. St. John, Chief Metallurgist, 5842 Trumbull Ave., Detroit, Mich.  
 FABRICA DE ACO PAULISTA S. A., Eric Tysklind, Managing Director, Caixa Postal 3190, Sao Paulo, Brazil.  
 FARM BUREAU OIL CO., INC., W. A. Herbst, Chemist, 733 W. Henry St., Indianapolis, Ind.  
 HOUSEHOLD FINANCE CORP., Research Dept., 919 N. Michigan Ave., Chicago, Ill.  
 KELLEY PLASTERBOARD CO., INC., S. J. Kelley, President, Delawanna, N. J.  
 MARATHON OIL CO., D. H. Merchant, Chief Chemist, Box 1508, Fort Worth, Tex.  
 PACIFIC CLAY PRODUCTS, H. W. Jewell, Engineer, 306 West Avenue 26, Los Angeles, Cal.  
 PETOSKEY PORTLAND CEMENT CO., John L. A. Galster, Treasurer and General Manager, Petoskey, Mich.  
 U. S. RUBBER PRODUCTS, INC., H. H. Weber, Assistant Manager, Wire Sales, Wire Division, 1790 Broadway, New York City.

### Individual and Other Members (50)

ACRES, W. P., Acting Technical Adviser, American Institute of Bolt, Nut and Rivet Manufacturers, 719 Guardian Bldg., Cleveland, Ohio.  
 ALPAUGH, G. LAUSON, Chemist, Taylor-Wharton Iron and Steel Co., High Bridge, N. J.  
 BECK, C. W., JR., President and General Manager, Motor Specialties Corp., 120 Mt. Elliott Ave., Detroit, Mich.  
 BEEKLEY, J. S., Ammonia Dept., E. I. du Pont de Nemours and Co., Box 1537, Charleston, W. Va.  
 CHAMBERLIN, A. C., Assistant to Manager, Research and Development Dept., Bethlehem Steel Co., Inc., Bethlehem, Pa.  
 CHINA BUREAU OF STANDARD WEIGHTS AND MEASURES, C. C. Wu, Director, Lower Floating Bridge, Nanking, China.  
 CLEVELAND, E. A., Chief Commissioner, Greater Vancouver Water District, 1303 Bekins Bldg., Vancouver, B. C., Canada.  
 CROSSET, D. A., Treasurer, Alloy Metal Wire Co., Moore, Pa.  
 DASHIELL, P. T., Vice-President in Charge of Production, The Philadelphia Gas Works Co., 1401 Arch St., Philadelphia, Pa.  
 DENNIS, C. C., General Superintendent, American Locomotive Co., Railway Steel-Spring Division, 30 Church St., New York City.  
 EGOROFF, M. N., Senior Engineer, Technical Research, Suburban Division, Resettlement Administration, 2020 Massachusetts Ave., Washington, D. C.  
 FITZSIMONS, OGDEN, Research Engineer, Floridin Co., Warren, Pa.  
 GILMORE, F. S., Highway Engineer, The Asphalt Inst., New York City. For mail: Dierks Bldg., Kansas City, Mo.  
 GILMORE, R. L., Sales Engineer, Superior Steel and Malleable Castings Co., Box 236, Benton Harbor, Mich.  
 GLASTONBURY, O. A., Public Officer, Adelaide Cement Co., Ltd., Box 536e, Adelaide, South Australia.  
 GODDARD, G. E., Empire Oil and Refining Co., Bartlesville, Okla.  
 HAHN, H. J., Chief Engineer, Wilbur B. Driver Co., 150 Riverside Ave., Newark, N. J.  
 HANAWALT, J. D., Director of X-ray and Spectroscopy Laboratory, The Dow Chemical Co., Midland, Mich.  
 HUTCHISON, G. F., Head of Analytical Dept., E. I. du Pont de Nemours and Co., Eastern Laboratory, Gibbstown, N. J.  
 INDIA, CHIEF CONTROLLER OF STANDARDIZATION, Central Standards Office for Railways, New Delhi, India.  
 KAWIN, C. C., President, Charles C. Kawin Co., 431 S. Dearborn St., Chicago, Ill.  
 KENNEY, FREDERICK, Consulting Chemist, 18 E. 41st St., New York City.  
 KIRKLIN, W. A., Chief Chemist, Hercules Powder Co., Experiment Station, Wilmington, Del.  
 KLEMGAARD, E. N., Technologist, Technical Dept., Shell Oil Co., Box 488, Martinez, Cal.

McNAMEE, R. L., Member of Firm, Shoecraft, Drury & McNamee, 103 E. Washington St., Ann Arbor, Mich.  
 McQUAID, D. J., Owner, Dan J. McQuaid Engineering Service, 614 Cooper Bldg., Denver, Colo.  
 MERGET, A. E., Chemist and Metallurgist, De Laval Separator Co., Pine and Water Sts., Poughkeepsie, N. Y.  
 MISSOURI SCHOOL OF MINES AND METALLURGY LIBRARY, University of Missouri, Rolla, Mo.  
 MONTANA STATE COLLEGE LIBRARY, Lois B. Payson, Librarian, Bozeman, Mont.  
 NORFOLK, CITY OF, I. R. Vanderberry, Purchasing Agent, Norfolk, Va.  
 NORTH CAROLINA STATE COLLEGE, D. H. HILL LIBRARY, W. P. Kellam, Librarian, State College Station, Raleigh, N. C.  
 OTT, S. J., Division Engineer, American Bridge Co., 71 Broadway, New York City.  
 PASSMORE, H. E., National Tube Co., Frick Bldg., Pittsburgh, Pa.  
 RAMAGE, J. H., Metallurgist, Westinghouse Lamp Co., Bloomfield, N. J.  
 REES, O. W., Associate Chemist, Analytical Division, Illinois State Geological Survey, 305 Ceramics Bldg., Urbana, Ill.  
 ROBBINS, W. E., Chief Chemist, Norco Refinery, Shell Petroleum Corp., Norco, La.  
 ROBERTS, ARTHUR, JR., Engineering Dept., Lynchburg Foundry Co., Lynchburg, Va.  
 RYLANDS, G. K., General Works Manager, Rylands Bros., Ltd., Warrington, England. For mail: Uplands, Moore, Nr. Warrington, England.  
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 SMITH, H. M., Petroleum Chemist, U. S. Bureau of Mines, Bartlesville, Okla.  
 SNELL, D. T., Chief Chemist, Consolidated Cement Corp., Cement City, Mich.  
 SPEER, R. L., Chief Chemist, Shell Petroleum Corp., Arkansas City, Kans.  
 STEINMAYER, A. G., Chief Engineer, Line Material Co., South Milwaukee, Wis.  
 STOKES, D. M., Chief Chemist, Cia Cubana de Cemento Portland, Cayo Mason, Cuba.  
 TERRELL, H. T., Sun Oil Co., 1608 Walnut St., Philadelphia, Pa.  
 UNIVERSITY OF CALIFORNIA LIBRARY, BRANCH OF THE COLLEGE OF AGRICULTURE, J. F. Wilson, Associate Professor of Animal Husbandry, Davis, Cal.  
 UNIVERSITY OF HAVANA, LIBRARY OF SCHOOL OF ENGINEERS, Isaac Cabrera, Director of Library, Havana, Cuba.  
 UNIVERSITY OF KENTUCKY, D. V. Terrell, Professor of Civil Engineering, Lexington, Ky.  
 WESLEY, C. I., Vice-President and Works Manager, Wesley Steel Treating Co., 1333 W. Pierce St., Milwaukee, Wis.  
 WISHART, H. B., Special Research Assistant in Engineering Materials, University of Illinois, Urbana, Ill. For mail: 907 W. Green St.

### Junior Members (6)

FRAGA, G. P., Civil Engineer, 173 Lafayette Ave., Brooklyn, N. Y.  
 KOCH, W. R., Junior Physicist, Materiel Division, U. S. Army Air Corps, Wright Field, Dayton, Ohio.  
 PARKS, M. J., Ex-Cell-O Aircraft and Tool Corp., 1200 Oakman Boulevard, Detroit, Mich.  
 PRESCOTT, H. L., Engineer, Westinghouse Electric and Manufacturing Co., Sharon, Pa.  
 SEABRIGHT, L. H., Metallurgist, Chevrolet Motor Co., Plant No. 4, Flint, Mich. For mail: 2016 Detroit St., Flint, Mich.  
 WEBSTER, W. H. C., Metallurgist, New York Shipbuilding Corp., Camden, N. J. For mail: 2333 N. 17th St., Philadelphia, Pa.

## The Cavitation of Metals

AT THE meeting of the Hydraulic Division of the American Society of Mechanical Engineers, in December, a paper was presented by H. N. Boetcher, Asst. to Supt. of Steam Stations, Consolidated Gas Co. of Baltimore, on the subject "The Behavior of Metals Under Cavitation Conditions." This paper discussed metallurgical aspects and showed photomicrographs of various materials tested by the Safe Harbor Water Power Co.

A number of members of the A.S.T.M., particularly those interested in corrosion and other metallurgical problems, may wish to obtain copies of the paper. A few complete copies are available and requests should be sent to A.S.T.M. Headquarters.



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## PERSONALS • • • News items concerning the activities of our members will be welcomed for inclusion in this column

V. J. VALLETTE, formerly Industrial Engineer, New England Box Co., is now Vice-President, Fessenden Cos., Inc., Townsend, Mass.

F. O. ANDEREGG is now connected with the Owens-Illinois Glass Co., Newark, Ohio, as Consulting Specialist on Building Materials.

E. H. TRUSSELL, who was Works Manager, Beckwith-Chandler Co., is now with the American Cyanamid & Chemical Co., Bridgeville, Pa.

F. H. FRANKLAND, who has been Technical Director with the American Institute of Steel Construction, has been designated Chief Engineer of the Institute. In 1933 Mr. Frankland took over the duties of this office in addition to his other functions in charge of the Institute's district offices and technical service.

J. F. JOHNSON, formerly Fuel Analyst, Florida East Coast Railway, has been appointed Inspector of Tests for the same company.

JAMES R. WITHROW, Chairman and Professor, Department of Chemical Engineering, Ohio State University, headed up a large group of committees in charge of arrangements for the recent annual meeting in Columbus of the American Institute of Chemical Engineers. At this meeting GUSTAV EGLOFF, Technical Director, Universal Oil Products, was elected a director of the Institute.

N. A. SHEPARD, Director of Chemical Research of the Firestone Tire & Rubber Co., has been elected chairman of the Rubber Division of the American Chemical Society for the 1935-1936 term.

C. C. HENNING, Assistant General Metallurgist, Jones & Laughlin Steel Corp., has received the Robert W. Hunt Award of the American Institute of Mining and Metallurgical Engineers for his paper "Manufacture and Properties of Bessemer Steel." The award is made each year for the best paper presented on the manufacture of iron and steel.

H. F. MOORE, Professor of Engineering Materials, University of Illinois, will be the Howe Memorial Lecturer at the A.I.M.E. annual meeting in 1936. Professor Moore's subject will be "The Correlation of Metallography and Strength of Materials."

C. G. FISHER, President, Fisher Scientific Co., was recently made Chairman of the Pittsburgh Section of the American Chemical Society for 1936.

W. D. MOORE, President of the American Cast Iron Pipe Co., has been elected President of the Birmingham Kiwanis Club.

A. C. FIELDNER, Chief Engineer, Experiment Stations Division, U. S. Bureau of Mines, has been selected as a member of the Executive Committee of the Third World Power Conference, which is to be held in Washington, D. C., September 7 to 12, 1936.

S. G. BLAYLOCK, Managing Director, Consolidated Mining and Smelting Co., Ltd., and J. L. CHRISTIE, Metallurgist, Bridgeport Brass Co., have been nominated as Directors of the American Institute of Mining and Metallurgical Engineers.

C. F. KETTERING, General Director, Research Section, General Motors Corp., will receive the Washington Award for 1936. The award is made annually as "an honor conferred upon a brother engineer by his fellow engineers on account of accomplishments which preëminently promote the happiness, comfort and well-being of humanity." The plaque will be presented to him in Chicago on February 27.

### Large Order for Standards

RECENTLY the Society received an order comprising 55 complete sets of the Book of Standards and Book of Tentative Standards. The order was transmitted through the U. S. Department of the Interior and most of the publications were shipped to the state directors of the Public Works Administration. In view of the extent of work under the auspices of this agency, the order is significant from the standpoint of the use of A.S.T.M. specifications.

## NECROLOGY

We announce with regret the death of the following members and representatives:

HARRY F. ANGSTADT, Sun Oil Co., Philadelphia, Pa. Member since 1928. Mr. Angstadt represented his company on Committee D-9 on Electrical Insulating Materials.

SIDNEY K. BECKER, Manager, Fairfield Foundry, United States Aluminum Co., Fairfield, Conn. Member since 1925. Mr. Becker was a member of Committees B-2 on Non-Ferrous Metals and Alloys and B-6 on Die Cast Metals and Alloys.

A. S. HENRY, Vice-President, American Locomotive Co., Railway Steel-Spring Division, New York City. Mr. Henry was a member of Committee A-1 on Steel.

H. L. HORNING, President, Waukesha Motor Co., Waukesha, Wis. Mr. Horning was a former member of Committee D-2 on Petroleum Products and Lubricants and had been chairman of its Technical Committee A on Gasoline.

JAMES MCKEE, Grease Plant Superintendent, Sun Oil Co., Marcus Hook, Pa. Member since 1930. Mr. McKee represented the National Association of Lubricating Grease Mfrs., Inc., on Committee D-2 on Petroleum Products and Lubricants.

GILBERT P. MCNIFF, Assistant Vice-President, National Tube Co., Pittsburgh, Pa. Member since 1916.

ASA E. PHILLIPS, Consulting Engineer, Washington D. C. Member since 1915. Mr. Phillips had been active in the work of a number of Society committees for many years. At the time of his death he was a member of Committee C-1 on Cement, the Sectional Committee on Specifications for Portland Cement and was chairman of Committee C-13 on Concrete Pipe. He had held this latter office since 1931.

C. A. PLASKETT, Senior Engineer, U. S. Forest Products Lab., Madison, Wis. Member since 1921. Mr. Plaskett, for many years a member of Committee D-10 on Shipping Containers, had served as secretary since 1924.

ARTHUR J. POOL, Chief Chemist, Consolidated Cement Corp., Cement City, Mich. Member since 1935.

ALBERT F. SHORE, President, The Shore Instrument and Manufacturing Co., Jamaica, N. Y. Member since 1910. Mr. Shore, who was the inventor of the scleroscope used in measuring the hardness of metals and an authority in this field, had taken part in various phases of Society work and presented a number of papers and discussions before meetings of the Society. As a result of his work, he was awarded the Elliot Cresson Medal by the Franklin Institute.

JOHN L. ZEIDLER, President, Zeidler Concrete Products Machinery Co., St. Joseph, Mo. Member since 1915. Mr. Zeidler was a member of Committee C-13 on Concrete Pipe.

### Papers on Boiler Feedwater Studies

DURING the recent A.S.M.E. annual meeting, a session was devoted to discussion of boiler feedwater studies at which a number of papers were presented. Through the courtesy of the American Society of Mechanical Engineers a limited number of copies of the following papers have been made available for distribution to A.S.T.M. members who request them:

- Estimation of Dissolved Solids in Boiler Water by Density Readings—J. A. Holmes and J. K. Rummel
- A Study of the Effect of Concentrated Sodium Hydroxide on Boiler Steel Under Tension—A. S. Perry
- Hydrogen Embrittlement—F. G. Straub

The Joint Research Committee on Boiler Feedwater Studies which arranged the session at which the papers were presented is jointly sponsored by several societies interested in this important work.

